of the English ecclesiastical structures in the middle ages, and must have been extensively imported into this country at a time when our own stone-quarries were little worked, and the mineral resources of England but imperfectly understood.

The colour of the magnesian limestone formed one of its recommendations with the commission of geologists and architects by whom it was selected. When first quarried, and for some time afterwards, whilst it retains its native moisture, the colour is not unlike that of brown sugar; when dry, the shade becomes much improved, being that of a delicate cream, and such is the condition of many blocks now to be seen in the walls; those composing the earlier portions of the building, however, have already assumed the dull, dingy, sooty appearance, which is common to all the buildings of the metropolis, and which will ultimately even reduce to an uniform shade every variety of colouring that can be introduced into the external walls of her buildings.

In examining a work of this vast magnitude, employing in its execution about 700 artificers, it is impossible not to be struck with the regularity and precision which prevail in every department, and with the numerous novel and ingenious devices had recourse to with the view of shortening the labour and perfecting the construction of the undertaking. Mr. Allan, the able foreman of the contractors, is entitled to much credit upon these points: the practical operations are for the most part confided to his care, and to him the constructive professions are indebted, amongst other matters, for great improvements in the system of scaffolding, for the introduction of zinc plates or moulds in lieu of the old wooden templets, and for improvements in the application of the travelling crane, a machine capable of far greater range, and therefore of more extensive utility, than the ordinary fixed swing crane. Besides these improvements of Mr. Allan, we notice the application of Dr. Spurgin's patent machine for hoisting bricks and mortar, thus dispensing with mortar-carriers, a class so well-known by the designation of "hod-men," and so exclusively composed of emigrants from the sister island (another grievance for Ireland!)—the employment of iron-girders and binders instead of wooden beams for all the principal floors, and of the patent galvanized iron instead of slates for covering the roofs.

The extensive use of iron, and the consequent exclusion of wood from all the main portions of the building, afford a very satisfactory security against fire, and we may therefore rejoice in the extreme improbability of the recurrence of such a catastrophe as that which destroyed its predecessor.

In concluding these briefs remarks, we cannot refrain from paying a just and well-merited tribute to the genius of the able architect who designed this building, and under whose direction it is now rapidly advancing to conclusion. Not alone does the design as a whole command respect and admiration for its noble and lofty proportions, its vast magnitude and the scale of luxurious amplitude which everywhere distinguish it; but, looking further into the structure, examining it piece by piece, and feature by feature, we are everywhere struck by new instances of ingenuity, skill, and talent, which are everywhere multiplied around, even down to the most insignificant details of secondry decoration.—*Times.*

MINERALOGY.

BY HENRY G. MONTAGUE, ESQ., PROFESSOR OF NATURAL PHILOSOPHY.

(*Continued from p.* 399.)

Calcareous Earths are those loose or concrete masses of earth which have a basis almost wholly consisting of the earth of lime, embracing the carbonates, sulphates, phosphates, muriates, &c., all of which bear the same relationship to the animal, as vegetable earth or *humus* does to the vegetable kingdom, being the distinguishing characteristic of animals; for although the earth of lime is sometimes found in vegetable species, still physiology teaches us, that its presence in these merely proceeds from accident of absorption from the soil or from the waters in which the plant is disposed.

Calcareous polypes, crustacea, and mollusca are the chief elaborators of this peculiar earth, and numerous fanciful imaginings are promulgated by modern geologists in order to account for its vast local accumulations. The calcareous polypes, and the more numerous and varying species of lime-secreting animals, occupy the hot and temperate zones of the earth as far as latitude 30° north and south, and they are in some measure governed in this geographical distribution by the general motion of the waters, which between these latitudes is from east to west. When carried beyond these zones many species wholly disappear; others, divested of their earthy covering, become naked polypes, and are known under other names; others again pass into varieties, in which their origin becomes obscured or wholly lost.

As the vast accumulated beds of earth demonstrate the present or previous existence of vegetation from whence they derive their origin, so is it with the vast beds of calcareous earth and limestone, which still more clearly manifest their origin, by preserving their organic forms through all the changes and vicissitudes which, of necessity, connect them with the fossil and mineral kingdoms; and the coral groups, of which a great portion of the British strata is composed, speak precisely the same language as the coral groups now filling up the Pacific, Southern, and Indian Oceans. Within those latitudes in which only they can exist, the like causes produce the like effects; but in the one and the other is infinite variety; in both, organic identity is lost for ever in the succession of changes to which the organic body is subject after the cessation of vital action.

The most common form of this earth is *carbonate of lime*—crystalline, as marble—amorphous, as limestone — farinaceous, as chalk—each of which presents numberless varieties. Of limestone I have already spoken in my previous papers. Let us now examine the other two. Chalk consists of carbonate of lime, and carbonic acid gas, and a few extraneous substances; it effervesces in, and is almost wholly soluble in acids, calcines in the fire, but does not vitrify in the strongest heat. The most common carbonates are shell-lime, testaceous lime being the comminuted particles of animals, common shaum earth or silvery chalk, arenaceous limestone, coral rag agaric, scaly lime, &c.

Farinaceous chalk forms a vast proportion of the superficial covering of the earth, embracing hill and even mountain ranges, and descending to still unascertained depths into the lower beds, and in whatever state of combination this substance may be found, it almost invariably presents evidence of organic origin. The form presented to us in the fossil and mineral kingdom is variable and uncertain, depending entirely upon the contingencies of climate, association, and accident of union; thus even in the same region, we have a variety of aspect and union: one solitary bed, or a succession of elevations, sometimes consists almost entirely of one family, another group of several families, another is a confused mass of animal bodies and reliquæ of bodies. Sometimes the entire masses are in the farinaceous state, at other times they abound with nodulates, and again, they assume the plastic or crystalline state. In general they present the phenomena of a series of deposits periodically disposed in succession upon each other, denoting a sequence of events unbroken for a long succession of ages, being alternations of generation and destruction.

This regularity of layers, so analogous to the phenomena of formed and forming beds now progressing in tropical seas, is strikingly manifest in the British strata, and much wonder is elicited even by men of science, as well as by the unlearned, when they behold the regularity of layers of flint and layers of chalk, not considering, that this regularity is common to all the stratified beds, and is still more extensively developed in the mining districts. Thus we sometimes observe a succession of oceanic and land deposits, the former being periodically covered in by the intrusion of the latter. Rivers at the period of flood bring down their deposits which are spread over the ocean bed; the causes of effects having ceased, these river deposits are in turn covered in, the fabric gradually rising by this conjoint action to the surface of the waters: beds of pearl oyster, of the common oyster, of corals, sponges, echinites, &c., are gradually formed; an eruption of matter in its disintegrated state takes place in the locality of the bed, and deposition takes place upon the bed; and in a few short hours generations are destroyed. The destroying cause ceasing, new orders, genera, and species spring forth, to be in turn overwhelmed by a similar catastrophe. Some of these disturbing causes are periodical, others result from the accident of disturbing causes, of flood, fire, or tempest. The after changes of strata that composed depend entirely upon local influences for the form or forms they may assume.

In whatever part of the world these chalk formations are disposed, we observe similar causes effecting varying results: in the ocean is the gradual formation of the aggregate; on the earth and in the earth the after changes are carried on: both prove the source and origin of the bodies of which the aggregate is composed. However distant from the sea, however high its elevation above the sea, its organic bodies in their fossilized state and ever varied appearance, prove their oceanic origin: there the layer of organic bodies still remains unchanged in its disposition and quantities, however it may have changed in its qualities, the one generation upon another exhibiting the progressive stages of life; the sponges, corals, and beds of mollusca still maintain their natural position, and the age of some of the mollusca evidencing a long succession of years, nay of ages, ere the bed could have been disturbed by the overlying matter. All extensive chalk formations are also undoubted evidence of oceanic origin.

The chalk formations are generally stratified, the thickness of the strata and its nature depending upon the chance of clime and association, and of disturbing causes. The peculiarity of the chalk deposit depends, first, upon the nature and qualities of the organic bodies of which it is composed, and the nature and qualities of bodies by which its changes are influenced. The thickness of the strata is generally the thickness of the living bed and the generations which precede it, being sometimes two or three inches, and sometimes many hundred feet. The deposited matter is at all times variably disposed in its quantities and in its qualities, being diffused throughout all kinds of strata as carbonate of lime, sand, clays, marles, and admixtures of two or more of these compounds.

It is evident also that the periods of disturbance by which the groups and families of oceanic orders, genera, and species were simultaneously destroyed by the sudden irruption of foreign matter have ever been, as they are now, inconstant and irregular; and the causes of disturbance have been, and still are, the exposure of the aggregate mass (produced beneath the ocean waters, principally of tropical seas), to terrestrial influences, or to the intrusion of foreign matters by local disturbances or general or local catastrophes. The material of the unstratified aggregates is at all times of similar composition and character to the material of the stratified masses; the only difference being—the one is formed by the comminuted particles of bodies or of polypi separated in death; the other is formed by polypi now in their state of degradation, or of depositions of carbonate of lime, and by the fossil bodies of mollusca, sponges, fish, sharks' teeth, bones, &c., the layers alternating.

In the formation termed by geologists oolite, and which is very abundant in this country, the shells in the hills are generally changed into cube spar, their cavities being lined with crystal; the corals have also undergone a similar transformation. The ammonites and nautili have frequently their chambers filled with spar of various colours, sometimes with clay, and commonly in the coal measures with liquid bitumen; in some the delicate partitions are converted in pyrites, and the cells are filled with white calcareous spar; but the modifications of change, and sometimes entire change, of these and other organic are far beyond enumeration, the body acted upon being the passive subject of surrounding influences.

The general character of the oolite and chalk is that of a system of ocean deposits, the progressive accumulations of years, nay of ages, beneath the waters, and occasionally or regularly interrupted by matter varying from the bulk of aggregate. Again, we distinctly see, in the orders, genera, and species, the inhabitants of quiet seas and tropical heat; deposited